Space Weather Forecast

Issued on Wednesday, 15 June 2022 at 01:17 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: G1 (Minor Storm) conditions likely Day 1 (15th), with a chance of a G2 (Moderate)Storm. Chance of Moderate-class flares. Slight chance of S1/Minor Solar Radiation Storms on all days.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity was Low in the last 24 hours, with several mid-high level Common-class flares. There are eight sunspot regions on the visible disc, the largest and most complex of which is a moderately large, complex region in the south centre disk. No earth-directed Coronal Mass Ejections (CMEs) have been observed.

Solar Wind / Geomagnetic Activity: The solar wind speed varied between slightly elevated and elevated levels. The Total Interplanetary magnetic field strength erratically decreased from moderate to weak during the period. The important north-south component, Bz, varied weakly. Geomagnetic activity was Quiet to Unsettled.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at slightly above background levels, but with no solar radiation storms thresholds reached.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to be Low or Moderate, with Moderate-class flares likely and a very slight chance of Strong-class flares, which would allow activity to become High.

Solar Wind / Geomagnetic Activity: A large CME was observed leaving the sun in the early hours of the 13th, in association with a long duration M3 flare. Its analysis revealed that while the bulk of the ejecta is expected to miss behind Earth's orbit, a glancing blow early on the 15th is likely. Solar wind speeds are expected to be at slightly elevated to elevated levels early on the 15th, perhaps increasing to strong for a time with the anticipated arrival of the indicated CME. Solar winds are then likely to be at mainly elevated levels through to the 18th with the onset and continuation of two high speed streams from coronal holes. Winds may return to slightly elevated levels later on the 18th.

Geomagnetic activity is likely to be Quiet or Unsettled initially, becoming Active or G1/Minor Storm, with a chance of a G2/Moderate Storm interval early on the 15th. Geomagnetic activity should then ease to become mainly Unsettled later in the day, however, the arrival of a high-speed stream early on the 16th may increase activity back to Active or G1/Minor Storm levels. Mainly unsettled activity is expected later on the 16th, though perhaps becoming Active again with the anticipated onset of another coronal hole on the 17th. At other times there is a chance of further Active or perhaps G1/Minor Storm intervals, but with a reducing risk over time.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is forecast to remain at background, or just above background levels during the period, with a slight chance of S1/Minor Storm conditions occurring.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	70	60	40	20
Strong	G3	No	5	3	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	50	50	50	50
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	10	10	10	10
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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